

What is claimed is:

- 1 1. An apparatus for identifying segments of multimedia data of interest, the
2 multimedia data comprising a stream of at least one of audio, video and text elements, the
3 elements having at least one attribute with a numerical value, the attribute being indicative of the
4 content of the element, the apparatus comprising:
5 an intra-attribute uniformity module for identifying a time period of uniformity, if any,
6 during which the numerical value of the attribute of the element of the respective stream meets
7 an attribute uniformity threshold; and
8 a module for identifying a segment of the multimedia data corresponding to the identified
9 time period of uniformity.
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11 2. The apparatus of claim 1, wherein the segment identifying module comprises an
12 attribute consolidation module for consolidating pairs of identified time periods of uniformity
13 into a single time period of uniformity that temporally comprises the pair of identified time
14 periods of uniformity.
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16 3. The apparatus of claim 2, wherein the consolidating of a pair is based on a
17 comparison between a time span intervening between the pair and a threshold that is based on the
18 attribute and on a characteristic of a predefined thematic collection of data.
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20 4. The apparatus of claim 2, wherein the attribute consolidation module identifies a
21 dominant attribute based on a comparison between a threshold and a parameter of a time period
22 of uniformity identified by the intra-attribute uniformity module.

1 5. The apparatus of claim 4, wherein the segment identifying module further
2 includes an inter-attribute merge module for forming a cumulative, inter-attribute, union of
3 identified and single periods, if any, determined based on a dominant attribute with identified
4 and single periods, if any, determined based on at least one other respective attribute, the union
5 defining a story segment time interval having a start time and an end time, at least some
6 cumulations in forming the union being conditional upon the existence of an intersection, at least
7 partial, between an identified or single period being accumulated and an identified or single
8 period already accumulated in forming the union.

9 6. The apparatus of claim 5, wherein the inter-attribute merge module indexes the
10 start time and end time of the story segment time interval by characteristics of content of a
11 portion of the multimedia data that is temporally within the story segment time interval.

12 7. The apparatus of claim 6, further comprising a multimedia segment linking
13 module for establishing a link among ones of indexed story segment time intervals that meet a
14 segment relatedness criterion.

15 8. The apparatus of claim 5, wherein said at least one other respective attribute
16 comprises at least two attributes, an ordering of attributes by which said cumulative, inter-
17 attribute union is formed being determined based on comparisons between thresholds and
18 respective parameters of a time period of uniformity identified by the intra-attribute uniformity
19 module.

1 9. The apparatus of claim 8, wherein the accumulations continue for multiple passes
2 over the attributes.

1 10. The apparatus of claim 9, wherein the multimedia data has a genre, and the
2 ordering changes based on the genre of the multimedia data on a second pass and subsequent
3 passes, if any.

1 11. The apparatus of claim 5, wherein said cumulative, inter-attribute union includes
2 identified and single periods that temporally intersect an identified or single period determined
3 based on a dominant attribute by at least a predetermined ratio of a length of the respective
4 identified or single period determined based on the dominant attribute.

1 12. The apparatus of claim 5, wherein said inter-attribute merge module is configured
2 to form an interim union of an identified or single period determined based on a first attribute
3 with an identified or single period determined based on a second attribute, the interim union
4 defining a period that is accumulated in forming the cumulative, inter-attribute union.

1 13. The apparatus of claim 5, said at least one other respective attribute comprising at
2 least two attributes, an ordering of attributes by which said cumulative, inter-attribute union is
3 formed being subject to revision as said stream of elements is processed by said apparatus to
4 identify one of said segments of multimedia data of interest.

1 14. The apparatus of claim 4, wherein the segment identifying module further
2 includes an inter-attribute merge module for forming a story segment time interval that

temporally defines a story segment comprising content characteristic of a portion of the stream that is located within an identified or single period determined based on a dominant attribute.

15. The apparatus of claim 2, wherein the segment identifying module further includes an inter-attribute merge module for forming a cumulative, inter-attribute, union of identified and single periods, if any, determined based on a pre-defined, dominant attribute with identified and single periods, if any, determined based on at least one other respective attribute, the union defining a story segment time interval having a start time and an end time.

16. The apparatus of claim 2, wherein the attributes have characteristics, the attribute consolidation module identifies a dominant attribute based on the characteristics of the attributes, the segment identifying module further including an inter-attribute merge module for forming a cumulative, inter-attribute, union of identified and single periods, if any, determined based on a dominant attribute with identified and single periods, if any, determined based on at least one other respective attribute, the union defining a story segment time interval having a start time and an end time, at least some cumulations in forming the union being conditional upon the existence of an intersection, at least partial, between an identified or single period being accumulated and an identified or single period already accumulated in forming the union.

17. The apparatus of claim 1, wherein the attribute comprises a close-caption attribute, the stream includes a text element having representative frames that have the close-caption attribute, the numerical value comprising a count of a number of close-caption marker elements encountered in one or more consecutive representative frames in said identifying of a time period of uniformity.

1 18. A method for identifying segments of multimedia data of interest, the multimedia
2 data comprising a stream of at least one of audio, video and text elements, the elements having at
3 least one attribute with a numerical value, the attribute being indicative of the content of the
4 element, the method comprising:

5 identifying a time period of uniformity, if any, during which the numerical value of the
6 attribute of the element of the respective stream meets an attribute uniformity threshold; and

7 identifying a segment of the multimedia data corresponding to the identified time period
8 of uniformity.

9 19. The method of claim 18, wherein the segment identifying comprises consolidating
10 pairs of identified time periods of uniformity into a single time period of uniformity that
11 temporally comprises the pair of identified time periods of uniformity.

12 20. The method of claim 19, wherein the segment identifying further comprises
13 comparing a time span intervening between the pair to a threshold that is based on the attribute
14 and on a characteristic of a predefined thematic collection of data wherein the consolidating of a
15 pair is based on a comparison.

16 21. The method of claim 19, wherein the segment identifying further comprises
17 comparing between a threshold and a parameter of a time period of uniformity to identify a
18 dominant attribute.

19 22. The method of claim 21, wherein the segment identifying further includes
20 forming a cumulative, inter-attribute, union of identified and single periods, if any, determined

3 based on a dominant attribute with identified and single periods, if any, determined based on
4 another respective attribute, the union defining a story segment time interval having a start time
5 and an end time.

1 23. A computer program for identifying segments of multimedia data of interest, the
2 multimedia data comprising a stream of at least one of audio, video and text elements, the
3 elements having at least one attribute with a numerical value, the attribute being indicative of the
4 content of the element, the method comprising:

5 instruction means for identifying a time period of uniformity, if any, during which the
6 numerical value of the attribute of the element of the respective stream meets an attribute
7 uniformity threshold; and

8 instruction means for identifying a segment of the multimedia data corresponding to the
9 identified time period of uniformity.
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